EBERLINE SERVICES

0061921

January 24, 2004

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Avenue
Richland, WA 99352

Reference: **P.O. #630**
Eberline Services R3-12-134-7670, SDG H2470

Dear Mr. Trent:

Enclosed is the data report for three soil samples designated under SAF No. F03-025 received at Eberline Services on December 18 and 19, 2003. The samples were analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion
Senior Program Manager

MCM/

Enclosure: Data Package

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2470 was composed of three soil samples designated under SAF No. F03-025 with a Project Designation of: 200-LW-1/LW-2 Characterization - Soil

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.7 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa Mannion

Melissa C. Mannion
Senior Program Manager

1/24/4

Date

E B E R L I N E S E R V I C E S / R I C H M O N D
SAMPLE DELIVERY GROUP H2470

SDG	7670
Contact	Melissa C. Mannion

Client	Hanford
Contract	No. 630
Case no	SDG H2470

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

Melen Mann
Prepared by

Melen Mann
Reviewed by

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

SDG 7670
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2470

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 01/24/04

SDG 7670
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2470

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

LAB SAMPLE SUMMARY

SDG 7670
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2470

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R312134-01	B17RV8	126-B-58 (35-37.5 ft)	SOLID		F03-025	F03-025-006	12/08/03 08:40
R312134-02	B17RW1	126-B-58 (52.5-55 ft)	SOLID		F03-025	F03-025-006	12/09/03 11:25
R312134-03	B17RT0	126-B-58 (11-13.5 ft)	SOLID		F03-025	F03-025-002	12/06/03 10:30
R312134-04	Lab Control Sample		SOLID		F03-025		
R312134-05	Method Blank		SOLID		F03-025		
R312134-06	Duplicate (R312134-01)	126-B-58 (35-37.5 ft)	SOLID		F03-025		12/08/03 08:40
R312134-07	Spike (R312134-01)	126-B-58 (35-37.5 ft)	SOLID		F03-025		12/08/03 08:40

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

SDG 7670
Contact Melissa C. Mannion

QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H2470

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7670	F03-025-002	B17RT0	SOLID	94.0	287.7 g		12/19/03	13	R312134-03	7670-003
	F03-025-006	B17RV8	SOLID	95.1	323.1 g		12/18/03	10	R312134-01	7670-001
		B17RW1	SOLID	95.0	281.2 g		12/18/03	9	R312134-02	7670-002
		Method Blank	SOLID						R312134-05	7670-005
		Lab Control Sample	SOLID						R312134-04	7670-004
		Duplicate (R312134-01)	SOLID	95.1	323.1 g		12/18/03	10	R312134-06	7670-006
		Spike (R312134-01)	SOLID	95.1	323.1 g		12/18/03	10	R312134-07	7670-007

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

SDG 7670
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H2470

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
TH	SOLID	Thorium, Isotopic in Soil	7080-198	5.0	3			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Soil	7080-198	10.0	3			1	1	1/1		
TC	SOLID	Technetium 99 in Soil	7080-198	10.0	3			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7080-198	15.0	3			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Soil	7080-198	10.0	3			1	1	1/1		
H	SOLID	Tritium in Soil	7080-198	10.0	3			1	1	1/1	1/1	X
NI_L	SOLID	Nickel 63 in Soil	7080-198	10.0	3			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

LAB WORK SUMMARY

SDG 7670
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2470

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R312134-01	B17RV8			7670-001	C		01/19/04	01/23/04	MWT	Carbon 14 in Soil
12/08/03	126-B-58 (35-37.5 ft)		SOLID	7670-001	GAM		01/13/04	01/23/04	MWT	Gamma Scan
12/18/03	F03-025-006	F03-025		7670-001	H		01/21/04	01/23/04	MWT	Tritium in Soil
				7670-001	NI_L		01/21/04	01/23/04	MWT	Nickel 63 in Soil
				7670-001	SR		01/12/04	01/23/04	MWT	Total Strontium in Soil
				7670-001	TC		01/20/04	01/23/04	MWT	Technetium 99 in Soil
				7670-001	TH		01/19/04	01/23/04	MWT	Thorium, Isotopic in Soil
R312134-02	B17RW1			7670-002	C		01/19/04	01/23/04	MWT	Carbon 14 in Soil
12/09/03	126-B-58 (52.5-55 ft)		SOLID	7670-002	GAM		01/14/04	01/23/04	MWT	Gamma Scan
12/18/03	F03-025-006	F03-025		7670-002	H		01/21/04	01/23/04	MWT	Tritium in Soil
				7670-002	NI_L		01/21/04	01/23/04	MWT	Nickel 63 in Soil
				7670-002	SR		01/12/04	01/23/04	MWT	Total Strontium in Soil
				7670-002	TC		01/20/04	01/23/04	MWT	Technetium 99 in Soil
				7670-002	TH		01/19/04	01/23/04	MWT	Thorium, Isotopic in Soil
R312134-03	B17RT0			7670-003	C		01/19/04	01/23/04	MWT	Carbon 14 in Soil
12/06/03	126-B-58 (11-13.5 ft)		SOLID	7670-003	GAM		01/14/04	01/23/04	MWT	Gamma Scan
12/19/03	F03-025-002	F03-025		7670-003	H		01/21/04	01/23/04	MWT	Tritium in Soil
				7670-003	NI_L		01/21/04	01/23/04	MWT	Nickel 63 in Soil
				7670-003	SR		01/12/04	01/23/04	MWT	Total Strontium in Soil
				7670-003	TC		01/20/04	01/23/04	MWT	Technetium 99 in Soil
				7670-003	TH		01/19/04	01/23/04	MWT	Thorium, Isotopic in Soil
R312134-04	Lab Control Sample			7670-004	C		01/20/04	01/23/04	MWT	Carbon 14 in Soil
			SOLID	7670-004	GAM		01/14/04	01/23/04	MWT	Gamma Scan
		F03-025		7670-004	H		01/21/04	01/23/04	MWT	Tritium in Soil
				7670-004	NI_L		01/21/04	01/23/04	MWT	Nickel 63 in Soil
				7670-004	SR		01/12/04	01/23/04	MWT	Total Strontium in Soil
				7670-004	TC		01/19/04	01/23/04	MWT	Technetium 99 in Soil
				7670-004	TH		01/19/04	01/23/04	MWT	Thorium, Isotopic in Soil
R312134-05	Method Blank			7670-005	C		01/19/04	01/23/04	MWT	Carbon 14 in Soil
			SOLID	7670-005	GAM		01/14/04	01/23/04	MWT	Gamma Scan
		F03-025		7670-005	H		01/22/04	01/23/04	MWT	Tritium in Soil
				7670-005	NI_L		01/21/04	01/23/04	MWT	Nickel 63 in Soil
				7670-005	SR		01/12/04	01/23/04	MWT	Total Strontium in Soil
				7670-005	TC		01/20/04	01/23/04	MWT	Technetium 99 in Soil
				7670-005	TH		01/19/04	01/23/04	MWT	Thorium, Isotopic in Soil

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

SDG 7670
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H2470

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R312134-06	Duplicate (R312134-01)			7670-006	C		01/19/04	01/23/04	MWT	Carbon 14 in Soil
12/08/03	126-B-58 (35-37.5 ft)		SOLID	7670-006	GAM		01/14/04	01/23/04	MWT	Gamma Scan
12/18/03		F03-025		7670-006	H		01/22/04	01/23/04	MWT	Tritium in Soil
				7670-006	NI_L		01/22/04	01/23/04	MWT	Nickel 63 in Soil
				7670-006	SR		01/12/04	01/23/04	MWT	Total Strontium in Soil
				7670-006	TC		01/20/04	01/23/04	MWT	Technetium 99 in Soil
				7670-006	TH		01/19/04	01/23/04	MWT	Thorium, Isotopic in Soil
R312134-07	Spike (R312134-01)			7670-007	H		01/22/04	01/23/04	MWT	Tritium in Soil
12/08/03	126-B-58 (35-37.5 ft)		SOLID							
12/18/03		F03-025								

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
C	F03-025	Carbon 14 in Soil	C14_COX_LSC	3			1	1	1		6
GAM	F03-025	Gamma Scan	GAMMA_GS	3			1	1	1		6
H	F03-025	Tritium in Soil	906.0_H3_LSC	3			1	1	1	1	7
NI_L	F03-025	Nickel 63 in Soil	NI63_LSC	3			1	1	1		6
SR	F03-025	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	3			1	1	1		6
TC	F03-025	Technetium 99 in Soil	TC99_TR_SEP_LSC	3			1	1	1		6
TH	F03-025	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	3			1	1	1		6
TOTALS				21			7	7	7	1	43

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

7670-005 Method Blank

METHOD BLANK

SDG 7670 Client/Case no Hanford SDG H2470
Contact Melissa C. Mannion Contract No. 630

Lab sample id R312134-05 Client sample id Method Blank
Dept sample id 7670-005 Material/Matrix SOLID
SAF No F03-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.530	0.21	0.39	400	U	H
Carbon 14	14762-75-5	-0.449	2.0	3.4	50	U	C
Nickel 63	13981-37-8	0.037	1.3	2.2	30	U	NI_L
Total Strontium	SR-RAD	-0.144	0.16	0.36	1.0	U	SR
Technetium 99	14133-76-7	-0.054	0.16	0.52	15	U	TC
Thorium 228	14274-82-9	-0.053	0.11	0.41		U	TH
Thorium 230	14269-63-7	0.053	0.21	0.40	1.0	U	TH
Thorium 232	TH-232	0	0.11	0.40	1.0	U	TH
Potassium 40	13966-00-2	U		0.52		U	GAM
Cobalt 60	10198-40-0	U		0.049	0.050	U	GAM
Cesium 137	10045-97-3	U		0.043	0.10	U	GAM
Radium 226	13982-63-3	U		0.076	0.10	U	GAM
Radium 228	15262-20-1	U		0.23	0.20	U	GAM
Europium 152	14683-23-9	U		0.10	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.073	0.10	U	GAM
Thorium 228	14274-82-9	U		0.052		U	GAM
Thorium 232	TH-232	U		0.23		U	GAM
Uranium 235	15117-96-1	U		0.12		U	GAM
Uranium 238	U-238	U		5.0		U	GAM
Americium 241	14596-10-2	U		0.092		U	GAM

200-LW-1/LW-2 Characterization Soil

QC-BLANK #46506

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

7670-004

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7670 | Client/Case no Hanford | SDG H2470

Contact Melissa C. Mannion | Contract No. 630

Lab sample id R312134-04 | Client sample id Lab Control Sample

Dept sample id 7670-004 | Material/Matrix SOLID

SAF No F03-025

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	12.0	0.45	0.36	400		H	12.8	0.51	94	84-116	80-120
Carbon 14	1980	40	10	50		C	2130	85	93	85-115	80-120
Nickel 63	276	5.8	2.8	30		NI_L	272	11	102	83-117	80-120
Total Strontium	12.5	0.68	0.26	1.0		SR	11.4	0.46	110	80-120	80-120
Technetium 99	118	2.7	0.51	15		TC	120	4.8	98	84-116	80-120
Thorium 230	53.6	5.9	0.36	1.0		TH	46.4	1.9	116	78-122	80-120
Cobalt 60	8.09	0.35	0.18	0.050		GAM	7.27	0.29	111	73-127	80-120
Cesium 137	7.25	0.28	0.21	0.10		GAM	6.51	0.26	111	73-127	80-120

200-LW-1/LW-2 Characterization Soil

QC-LCS #46505

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

7670-006 B17RV8

DUPLICATE

SDG 7670 Client/Case no Hanford SDG H2470

Contact Melissa C. Mannion Contract No. 630

DUPLICATE	ORIGINAL	
Lab sample id R312134-06	Lab sample id R312134-01	Client sample id B17RV8
Dept sample id 7670-006	Dept sample id 7670-001	Location/Matrix 126-B-58 (35-37.5 ft) SOLID
	Received 12/18/03	Collected/Weight 12/08/03 08:40 323.1 g
% solids 95.1	% solids 95.1	Custody/SAF No F03-025-006 F03-025

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALIFIERS	RPD %	3σ PROT TOT LIMIT
Tritium	38.2	0.73	0.36	400		H	37.6	0.71	0.35		2	22
Carbon 14	-0.744	1.6	2.6	50	U	C	-1.25	1.5	2.6	U	-	
Nickel 63	-0.298	1.5	2.5	30	U	NI_L	0.124	1.4	2.4	U	-	
Total Strontium	-0.007	0.14	0.27	1.0	U	SR	0.119	0.13	0.25	U	-	
Technetium 99	-0.119	0.16	0.58	15	U	TC	0.116	0.19	0.56	U	-	
Thorium 228	1.02	0.47	0.36			TH	0.812	0.39	0.37		23	101
Thorium 230	0.325	0.28	0.36	1.0	U	TH	0.668	0.48	0.46		69	168
Thorium 232	0.557	0.28	0.36	1.0		TH	0.858	0.39	0.36		43	102
Potassium 40	11.9	1.6	1.1			GAM	12.3	7.5	1.1		3	100
Cobalt 60	U		0.12	0.050	U	GAM	U		0.11	U	-	
Cesium 137	U		0.14	0.10	U	GAM	U		0.095	U	-	
Radium 226	0.465	0.16	0.18	0.10		GAM	0.499	0.42	0.20		7	143
Radium 228	0.722	0.36	0.39	0.20		GAM	0.676	0.56	0.41		7	146
Europium 152	U		0.20	0.10	U	GAM	U		0.23	U	-	
Europium 154	U		0.29	0.10	U	GAM	U		0.30	U	-	
Europium 155	U		0.20	0.10	U	GAM	U		0.18	U	-	
Thorium 228	0.806	0.15	0.15			GAM	0.585	0.27	0.11		32	74
Thorium 232	0.722	0.36	0.39			GAM	0.676	0.56	0.41		7	146
Uranium 235	U		0.29		U	GAM	U		0.31	U	-	
Uranium 238	U		11		U	GAM	U		12	U	-	
Americium 241	U		0.22		U	GAM	U		0.079	U	-	

200-LW-1/LW-2 Characterization Soil

QC-DUP#1 46507

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

7670-007 B17RV8

MATRIX SPIKE

SDG 7670 Client/Case no Hanford SDG H2470

Contact Melissa C. Mannion Contract No. 630

MATRIX SPIKE	ORIGINAL	
Lab sample id R312134-07	Lab sample id R312134-01	Client sample id B17RV8
Dept sample id 7670-007	Dept sample id 7670-001	Location/Matrix 126-B-58 (35-37.5 ft) SOLID
	Received 12/18/03	Collected/Weight 12/08/03 08:40 323.1 g
% solids 95.1	% solids 95.1	Custody/SAF No F03-025-006 F03-025

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	90.4	1.1	0.36	400	X	H	53.0	2.1	37.6	0.71	100	71-129	60-140

200-LW-1/LW-2 Characterization Soil

QC-MS#1 46508

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-MS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

7670-001 B17RV8

DATA SHEET

SDG	7670	Client/Case no	Hanford SDG H2470
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R312134-01	Client sample id	B17RV8
Dept sample id	7670-001	Location/Matrix	126-B-58 (35-37.5 ft) SOLID
Received	12/18/03	Collected/Weight	12/08/03 08:40 323.1 g
% solids	95.1	Custody/SAF No	F03-025-006 F03-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	37.6	0.71	0.35	400		H
Carbon 14	14762-75-5	-1.25	1.5	2.6	50	U	C
Nickel 63	13981-37-8	0.124	1.4	2.4	30	U	NI_L
Total Strontium	SR-RAD	0.119	0.13	0.25	1.0	U	SR
Technetium 99	14133-76-7	0.116	0.19	0.56	15	U	TC
Thorium 228	14274-82-9	0.812	0.39	0.37			TH
Thorium 230	14269-63-7	0.668	0.48	0.46	1.0		TH
Thorium 232	TH-232	0.858	0.39	0.36	1.0		TH
Potassium 40	13966-00-2	12.3	7.5	1.1			GAM
Cobalt 60	10198-40-0	U		0.11	0.050	U	GAM
Cesium 137	10045-97-3	U		0.095	0.10	U	GAM
Radium 226	13982-63-3	0.499	0.42	0.20	0.10		GAM
Radium 228	15262-20-1	0.676	0.56	0.41	0.20		GAM
Europium 152	14683-23-9	U		0.23	0.10	U	GAM
Europium 154	15585-10-1	U		0.30	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	0.585	0.27	0.11			GAM
Thorium 232	TH-232	0.676	0.56	0.41			GAM
Uranium 235	15117-96-1	U		0.31		U	GAM
Uranium 238	U-238	U		12		U	GAM
Americium 241	14596-10-2	U		0.079		U	GAM

200-LW-1/LW-2 Characterization Soil

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

7670-002 B17RW1

DATA SHEET

SDG	7670	Client/Case no	Hanford SDG H2470
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R312134-02	Client sample id	B17RW1
Dept sample id	7670-002	Location/Matrix	126-B-58 (52.5-55 ft) SOLID
Received	12/18/03	Collected/Weight	12/09/03 11:25 281.2 g
% solids	95.0	Custody/SAF No	F03-025-006 F03-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	47.8	0.83	0.38	400		H
Carbon 14	14762-75-5	-0.777	1.9	3.3	50	U	C
Nickel 63	13981-37-8	0.934	1.5	2.4	30	U	NI_L
Total Strontium	SR-RAD	0.004	0.12	0.25	1.0	U	SR
Technetium 99	14133-76-7	0.069	0.18	0.54	15	U	TC
Thorium 228	14274-82-9	0.832	0.48	0.45			TH
Thorium 230	14269-63-7	0.474	0.36	0.45	1.0		TH
Thorium 232	TH-232	1.13	0.49	0.45	1.0		TH
Potassium 40	13966-00-2	15.5	2.6	1.9			GAM
Cobalt 60	10198-40-0	U		0.29	0.050	U	GAM
Cesium 137	10045-97-3	U		0.16	0.10	U	GAM
Radium 226	13982-63-3	0.604	0.32	0.32	0.10		GAM
Radium 228	15262-20-1	0.712	0.48	0.53	0.20		GAM
Europium 152	14683-23-9	U		0.30	0.10	U	GAM
Europium 154	15585-10-1	U		0.52	0.10	U	GAM
Europium 155	14391-16-3	U		0.32	0.10	U	GAM
Thorium 228	14274-82-9	1.02	0.24	0.25			GAM
Thorium 232	TH-232	0.712	0.48	0.53			GAM
Uranium 235	15117-96-1	U		0.47		U	GAM
Uranium 238	U-238	U		18		U	GAM
Americium 241	14596-10-2	U		0.34		U	GAM

200-LW-1/LW-2 Characterization Soil

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

7670-003 B17RT0

DATA SHEET

SDG	7670	Client/Case no	Hanford SDG H2470
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R312134-03	Client sample id	B17RT0
Dept sample id	7670-003	Location/Matrix	126-B-58 (11-13.5 ft) SOLID
Received	12/19/03	Collected/Weight	12/06/03 10:30 287.7 g
% solids	94.0	Custody/SAF No	F03-025-002 F03-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.322	0.21	0.36	400	U	H
Carbon 14	14762-75-5	-0.749	1.6	2.8	50	U	C
Nickel 63	13981-37-8	-0.316	1.5	2.5	30	U	NI_L
Total Strontium	SR-RAD	0.281	0.14	0.22	1.0		SR
Technetium 99	14133-76-7	0.131	0.20	0.58	15	U	TC
Thorium 228	14274-82-9	1.24	0.51	0.38			TH
Thorium 230	14269-63-7	0.397	0.40	0.38	1.0		TH
Thorium 232	TH-232	0.496	0.30	0.38	1.0		TH
Potassium 40	13966-00-2	16.4	1.5	0.79			GAM
Cobalt 60	10198-40-0	U		0.10	0.050	U	GAM
Cesium 137	10045-97-3	0.343	0.088	0.077	0.10		GAM
Radium 226	13982-63-3	0.575	0.14	0.15	0.10		GAM
Radium 228	15262-20-1	1.20	0.36	0.33	0.20		GAM
Europium 152	14683-23-9	U		0.19	0.10	U	GAM
Europium 154	15585-10-1	U		0.28	0.10	U	GAM
Europium 155	14391-16-3	U		0.16	0.10	U	GAM
Thorium 228	14274-82-9	0.939	0.092	0.086			GAM
Thorium 232	TH-232	1.20	0.36	0.33			GAM
Uranium 235	15117-96-1	U		0.23		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.19		U	GAM

200-LW-1/LW-2 Characterization Soil

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

Test TH Matrix SOLID
SDG 7670
Contact Melissa C. Mannion

LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2470

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Thorium 230
Preparation batch 7080-198					
R312134-01			7670-001	B17RV8	0.668
R312134-02			7670-002	B17RW1	0.474
R312134-03			7670-003	B17RT0	0.397
R312134-04			7670-004	LCS (QC ID=46505)	ok
R312134-05			7670-005	BLK (QC ID=46506)	U
R312134-06			7670-006	Duplicate (R312134-01)	ok U
Nominal values and limits from method 200-LW-1/LW-2 Characterization Soil				RDLs (pCi/g)	1.0

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7080-198			2σ prep error 5.0 %		Reference Lab Notebook 7080 pg. 198											
R312134-01			B17RV8	0.46	0.250			71		153			42	01/19/04	01/19	SS-056
R312134-02			B17RW1	0.45	0.250			60		153			41	01/19/04	01/19	SS-057
R312134-03			B17RT0	0.38	0.250			71		153			44	01/19/04	01/19	SS-058
R312134-04			LCS (QC ID=46505)	0.36	0.250			76		152				01/19/04	01/19	SS-059
R312134-05			BLK (QC ID=46506)	0.40	0.250			64		152				01/19/04	01/19	SS-060
R312134-06			Duplicate (R312134-01) (QC ID=46507)	0.36	0.250			75		152			42	01/19/04	01/19	SS-061
Nominal values and limits from method				1.0	0.250			20-105		150			180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	CP-061	Determination of Moisture Content in Solid Samples rev 1
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-900	Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 0.40 ± 0.088
YIELD 70 ± 13

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

Test SR Matrix SOLID
SDG 7670
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2470

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Strontium
Preparation batch 7080-198					
R312134-01			7670-001	B17RV8	U
R312134-02			7670-002	B17RW1	U
R312134-03			7670-003	B17RT0	0.281
R312134-04			7670-004	LCS (QC ID=46505)	ok
R312134-05			7670-005	BLK (QC ID=46506)	U
R312134-06			7670-006	Duplicate (R312134-01)	- U
Nominal values and limits from method 200-LW-1/LW-2 Characterization Soil				RDLs (pCi/g)	1.0

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7080-198 2σ prep error 10.0 % Reference Lab Notebook 7080 pg. 198																
R312134-01			B17RV8	0.25	1.00			98		100			35	01/12/04	01/12	GRB-217
R312134-02			B17RW1	0.25	1.00			98		100			34	01/12/04	01/12	GRB-218
R312134-03			B17RT0	0.22	1.00			99		100			37	01/12/04	01/12	GRB-221
R312134-04			LCS (QC ID=46505)	0.26	1.00			76		100				01/12/04	01/12	GRB-222
R312134-05			BLK (QC ID=46506)	0.36	1.00			70		100				01/12/04	01/12	GRB-204
R312134-06			Duplicate (R312134-01) (QC ID=46507)	0.27	1.00			98		100			35	01/12/04	01/12	GRB-231
Nominal values and limits from method				1.0	1.00			30-105		100			180			

PROCEDURES

REFERENCE	SRTOT_SEP_PRECIP_GPC	
CP-061	Determination of Moisture Content in Solid Samples rev 1	
CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2	
CP-381	Strontium in Solids, rev 1	

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 0.27 ± 0.096
YIELD 90 ± 26

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

Test TC Matrix SOLID
SDG 7670
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2470

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Technetium 99	
Preparation batch 7080-198						
R312134-01			7670-001	B17RV8	U	
R312134-02			7670-002	B17RW1	U	
R312134-03			7670-003	B17RT0	U	
R312134-04			7670-004	LCS (QC ID=46505)	ok	
R312134-05			7670-005	BLK (QC ID=46506)	U	
R312134-06			7670-006	Duplicate (R312134-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	15	
200-LW-1/LW-2 Characterization Soil						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7080-198			2σ prep error 10.0 % Reference Lab Notebook 7080 pg. 198													
R312134-01			B17RV8	0.56	1.02			90	50				43	01/15/04	01/20	GRB-217
R312134-02			B17RW1	0.54	1.01			93	50				42	01/15/04	01/20	GRB-218
R312134-03			B17RT0	0.58	1.01			90	50				45	01/15/04	01/20	GRB-219
R312134-04			LCS (QC ID=46505)	0.51	1.00			101	50					01/15/04	01/19	GRB-230
R312134-05			BLK (QC ID=46506)	0.52	1.00			97	50					01/15/04	01/20	GRB-220
R312134-06			Duplicate (R312134-01) (QC ID=46507)	0.58	1.02			91	50				43	01/15/04	01/20	GRB-201
Nominal values and limits from method				15	1.00			20-105	50				180			

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
	CP-021	Preparation of Tc-99m Tracer, rev 2
	CP-002	Q.C. Preparation, rev 4
	CP-003	Addition of Carriers and Tracers, rev 5
	CP-431	Technetium-99 Purification of Soil or Resin by Extraction Chromatography, rev 0
	CP-008	Heavy Element Electroplating, rev 7

AVERAGES ± 2 SD FOR 6 SAMPLES			
	MDA	0.55	± 0.060
	YIELD	94	± 9

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

Test GAM Matrix SOLID
SDG 7670
Contact Melissa C. Mannion

LAB METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2470

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60	Cesium 137
Preparation batch 7080-198						
R312134-01			7670-001	B17RV8	U	U
R312134-02			7670-002	B17RW1	U	U
R312134-03			7670-003	B17RT0	U	0.343
R312134-04			7670-004	LCS (QC ID=46505)	ok	ok
R312134-05			7670-005	BLK (QC ID=46506)	U	U
R312134-06			7670-006	Duplicate (R312134-01)	- U	- U
Nominal values and limits from method 200-LW-1/LW-2 Characterization Soil				RDLs (pCi/g)	0.050	0.10

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7080-198			2σ prep error 15.0 % Reference Lab Notebook 7080 pg. 198													
R312134-01			B17RV8	0.80	47.2					850			36	01/06/04	01/13	PD,07,00
R312134-02			B17RW1	1.3	42.6					377			36	01/06/04	01/14	PD,03,00
R312134-03			B17RT0	0.70	42.1					402			39	01/06/04	01/14	PD,04,00
R312134-04			LCS (QC ID=46505)	0.18	42.1					402				01/06/04	01/14	PD,07,00
R312134-05			BLK (QC ID=46506)	0.36	42.1					793				01/06/04	01/14	PD,04,00
R312134-06			Duplicate (R312134-01) (QC ID=46507)	0.86	47.2					767			37	01/06/04	01/14	PD,03,00
Nominal values and limits from method				0.050	42.1					100			180			

PROCEDURES

REFERENCE	GAMMA_GS	
CP-061	Determination of Moisture Content in Solid Samples rev 1	
CP-100	Ge(Li) Preparation for Commercial Samples, rev 5	

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 0.70 ± 0.79
YIELD ____ ± ____

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

Test C___ Matrix SOLID
SDG 7670
Contact Melissa C. Mannion

LAB METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2470

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Carbon 14	
Preparation batch 7080-198						
R312134-01			7670-001	B17RV8	U	
R312134-02			7670-002	B17RW1	U	
R312134-03			7670-003	B17RT0	U	
R312134-04			7670-004	LCS (QC ID=46505)	ok	
R312134-05			7670-005	BLK (QC ID=46506)	U	
R312134-06			7670-006	Duplicate (R312134-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	50	
200-LW-1/LW-2 Characterization Soil						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7080-198			2σ prep error 10.0 %	Reference Lab Notebook 7080 pg. 198												
R312134-01			B17RV8	2.6	0.396			100		100			42	01/08/04	01/19	LSC-004
R312134-02			B17RW1	3.3	0.309			100		100			41	01/08/04	01/19	LSC-004
R312134-03			B17RT0	2.8	0.367			100		100			44	01/08/04	01/19	LSC-004
R312134-04			LCS (QC ID=46505)	10	0.300			100		11				01/08/04	01/20	LSC-004
R312134-05			BLK (QC ID=46506)	3.4	0.300			100		100				01/08/04	01/19	LSC-004
R312134-06			Duplicate (R312134-01) (QC ID=46507)	2.6	0.389			100		100			42	01/08/04	01/19	LSC-004
Nominal values and limits from method				50	0.300					50			180			

PROCEDURES REFERENCE C14_COX_LSC
CP-251 Tritium/Carbon-14 Oxidation, rev 5

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 4.1 ± 5.8
YIELD 100 ± 0

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

Test H Matrix SOLID
SDG 7670
Contact Melissa C. Mannion

LAB METHOD SUMMARY

TRITIUM IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2470

RESULTS

LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	CLIENT SAMPLE ID	Tritium	
Preparation batch 7080-198						
R312134-01			7670-001	B17RV8	37.6	
R312134-02			7670-002	B17RW1	47.8	
R312134-03			7670-003	B17RT0	U	
R312134-04			7670-004	LCS (QC ID=46505)	ok	
R312134-05			7670-005	BLK (QC ID=46506)	U	
R312134-06			7670-006	Duplicate (R312134-01)	ok	
R312134-07			7670-007	Spike (R312134-01)	ok	X
Nominal values and limits from method				RDLs (pCi/g)	400	
200-LW-1/LW-2 Characterization Soil						

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7080-198			2σ prep error 10.0 %		Reference Lab Notebook 7080 pg. 198											
R312134-01			B17RV8	0.35	21.0			33		120			44	01/19/04	01/21	LSC-005
R312134-02			B17RW1	0.38	20.5			34		120			43	01/19/04	01/21	LSC-005
R312134-03			B17RT0	0.36	20.8			33		120			46	01/19/04	01/21	LSC-005
R312134-04			LCS (QC ID=46505)	0.36	20.0			33		120				01/19/04	01/21	LSC-005
R312134-05			BLK (QC ID=46506)	0.39	20.0			33		120				01/19/04	01/22	LSC-005
R312134-06			Duplicate (R312134-01) (QC ID=46507)	0.36	21.4			34		120			45	01/19/04	01/22	LSC-005
R312134-07			Spike (R312134-01) (QC ID=46508)	0.36	21.4			33		120			45	01/19/04	01/22	LSC-005
Nominal values and limits from method				400	20.0					25			180			

PROCEDURES REFERENCE 906.0_H3_LSC
CP-218 Tritium in Soil Samples by Azeotropic Distillation, rev 1

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 0.37 ± 0.028
YIELD 33 ± 1

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

Test NI_L Matrix SOLID
SDG 7670
Contact Melissa C. Mannion

LAB METHOD SUMMARY

NICKEL 63 IN SOIL
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2470

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Nickel 63
Preparation batch 7080-198					
R312134-01			7670-001	B17RV8	U
R312134-02			7670-002	B17RW1	U
R312134-03			7670-003	B17RT0	U
R312134-04			7670-004	LCS (QC ID=46505)	ok
R312134-05			7670-005	BLK (QC ID=46506)	U
R312134-06			7670-006	Duplicate (R312134-01)	- U
Nominal values and limits from method 200-LW-1/LW-2 Characterization Soil				RDLs (pCi/g)	30

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7080-198			2σ prep error 10.0 %	Reference Lab Notebook 7080 pg. 198												
R312134-01			B17RV8	2.4	0.500			87		100			44	01/20/04	01/21	LSC-004
R312134-02			B17RW1	2.4	0.500			85		100			43	01/20/04	01/21	LSC-004
R312134-03			B17RT0	2.5	0.500			83		100			46	01/20/04	01/21	LSC-004
R312134-04			LCS (QC ID=46505)	2.8	0.500			94		66				01/20/04	01/21	LSC-004
R312134-05			BLK (QC ID=46506)	2.2	0.500			94		100				01/20/04	01/21	LSC-004
R312134-06			Duplicate (R312134-01) (QC ID=46507)	2.5	0.500			85		100			45	01/20/04	01/22	LSC-004
Nominal values and limits from method				30	0.500			30-105		50			180			

PROCEDURES	REFERENCE	NI63_LSC
	CP-061	Determination of Moisture Content in Solid Samples rev 1
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 2
	CP-280	Nickel-63 Purification, rev 0

AVERAGES ± 2 SD FOR 6 SAMPLES				
	MDA	2.5	±	0.39
	YIELD	88	±	10

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 01/24/04

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2470

SDG 7670
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2470

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 01/24/04

SDG 7670
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2470

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 01/24/04

SDG 7670
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2470

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2470

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H2470

DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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SDG 7670
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GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2470

DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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Form DVD-RG
Version 3.06
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REPORT GUIDE

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Contract No. 630
Case no SDG_H2470

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

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Version Ver 1.0
Form DVD-RG
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REPORT GUIDE

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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GUIDE, cont.

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Contract No. 630
Case no SDG_H2470

DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

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GUIDE, cont.

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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REPORT GUIDE

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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GUIDE, cont.

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METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

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METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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GUIDE, cont.

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METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 01/24/04

FLUOR Hanford Inc. | **CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | F03-025-006

Collector: Pope/Pfister/Hughes	Company Contact: TRENT, STEVE — Telephone No. 373-5689	Project Coordinator: TRENT, SJ	Price Code 8N — Data Turnaround 45 Days
Project Designation: 200-LW-1/LW-2 Characterization - Soil	Sampling Location: 216-B-58 (35 - 37.5 ft) H2470 (7670)	SAF No. F03-025	Air Quality ☐
Ice Chest No. GPP-03-011	Field Logbook No. HNF-3561 — COA 119143ES10	Method of Shipment: FEDERAL EXPRESS	
Shipped To: EBERLINE SERVICES (Formerly TMA)	Offsite Property No.	Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS

Rad tie to B17RW0

Special Handling and/or Storage

Preservation	Cool 4C	None									
Type of Container	G	G/P									
No. of Container(s)	1	1									
Volume	250mL	250mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time											
B17RV8	SOIL	12-8-3	08:40		✓									

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Hughes	12-8-3 13:00	Site fridge RMA 26B	12-8-3/1300
Kevin Hughes	12-9-3	RDA	12-9-3
Site fridge RMA 26B	12-9-3 0830	Kevin Hughes	12-9-3 0830
Kevin Hughes	12-9-03 1230	[illegible]	12-9-03 1230
[illegible]	12-9-03	KEF #2 MO-026	12-9-03 1430
KEF #2 MO-026	12-11-03 1000	[illegible]	12-11-03 1000

SPECIAL INSTRUCTIONS

The laboratory is to analyze pH within 24 hours of sample receipt. ~~The laboratory is to report kerosene-range organics from the WTPH-D analysis.~~ See SAF COC Comments for holding time issues. 12/2/03

~~(1) Chromium Hex - 7196; NO2/NO3 - 353.2; Sulfides - 9030; Oil & Grease - 413.1~~ 12/2/03

(2) Nickel-63; Gamma Spec - Radium {Radium-226, Radium-228}; Technetium-99; Isotopic Thorium {Thorium-232}; Tritium - H3; Carbon-14; Strontium-89,90 -- Total Sr

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

H2470 (7670)

Fluor Hanford, Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of 2

Collector: Pope/Pfister/Hughes	Company Contact: Trent, Steve	Telephone No.: 373-5689	Project Coordinator: Trent, SJ	Price Code / Data Turnaround
Project Designation: 200-LW-1/LW-2 Charac.	Sampling Location: 216-B-58 (35-37.5 ft)		SAF No.: F03-025	Air Quality ☐
Ice Chest No.: SEE 05PC	Field Logbook No.: HNF-N-35601	COA: 119143ES10	Method of Shipment: Federal Express	
Shipped To: Eberline-Thermo	Offsite Property No.: A040085		Bill of Lading/Air Bill No.: SEE 05PC	

POSSIBLE SAMPLE HAZARDS/REMARKS: Rad Tie To B17RW0

Special Handling and/or Storage:

Preservation	Cool 4C	NONE
Type of Container	G	G/P
No. of Container(s)	250mL	250mL
Volume		1
SAMPLE ANALYSIS	See item (1) special instructions	See item (2) special instructions

Sample No.	Matrix*	Sample Date	Sample Time		
B17RV8	Soil	12-8-03	0840	/	X

CHAIN OF POSSESSION	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From: [signature]	1030	Received By/Stored In: KEF #2 MO-0210	12-11-03 1030
Relinquished By/Removed From: MO-0226	12/17/03 0930	Received By/Stored In: M.H. Dulcher / M.H. Dulcher	12/17/03 0930
Relinquished By/Removed From: M.H. Dulcher / M.H. Dulcher	12/17/03 0930	Received By/Stored In: Fed Ex	
Relinquished By/Removed From		Received By/Stored In: [signature]	12/18/03
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) ~~Chromium Hex - 7196; NO2/NO3 - 353.2; Sulfides - 9030, Oil + Grease - 413.1~~

(2) Nickel-63; Gamma Spec - Radium {Radium-228}; Tech-99; Isotopic Thorium {Thorium-232}; Tritium-H3; Carbon-14, Sr-89,90 - Total Sr

Matrix*: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618 (03/03)

MS 121703

Fluor Hanford, Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		Page 2 of 2
Collector: Pope / Pfister / Hughes	Company Contact: Trent / Steve; Telephone No. 373-5089	Project Coordinator: Trent, SJ	Price Code: ~~8N~~ 4S ~~-01~~ (MS 121703); Data Turnaround
Project Designation: 200-UW-1/UW-2	Sampling Location: 216-B-58 (52.5-55 ft)	SAF No. F03-025	Air Quality ☐
Ice Chest No.: SEE OSPC	Field Logbook No.; COA: H2470	Method of Shipment: FED EX	
Shipped To: EBerline / ~~Recra~~ (MS 121703)	Offsite Property No. A040 085 (7670)	Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Rad Tie To: B17RW3

Special Handling and/or Storage

	Preservation	Cool 4C	NONE
	Type of Container	G	G
	No. of Container(s)	1	1
	Volume	250mL	250mL
SAMPLE ANALYSIS		See item (1) special instructions	See item (2) special instructions

Sample No.	Matrix*	Sample Date	Sample Time										
B17RW1	Soil	12-9-03	1125		X								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	12/9/03	MMB	12/9/03
MO-026 Rf 2	12/17/03 0930	M.H. Buechler / M.H. Buechler	12/17/03 0930
M.H. Buechler / M.H. Buechler	12/17/03 0932	Fed Ex	
		[illegible]	12/18/03 0930

SPECIAL INSTRUCTIONS

(2) Nickel-63; Gamma Spec - Radium (Radium-226, Radium-228) Tech-99; Isotopic Thorium (Thorium-232) Tritium-2323; Tritium-H3; Carbon-14; Strontium-89,90 -- Total Sr

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618 (03/03)

2 DID 12/17/03

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-025-007	Page 1 of 1

Collector: Pope/Plasto/Hughes

Company Contact: TRENT, STEVE — **Telephone No.:** 373-5689

Project Coordinator: TRENT, SJ

Price Code: 8N — **Data Turnaround:** 45 Days

Project Designation: 200-LW-1/LW-2 Characterization - Soil

Sampling Location: 216-B-58 (52.5 - 55 ft) H2470 (7670)

SAF No.: F03-025

Air Quality ☐

Ice Chest No.:

Field Logbook No.: HNF3561

COA: 119143ES10

Method of Shipment: FEDERAL EXPRESS

Shipped To: EBERLINE SERVICES (Formerly TMA)

Offsite Property No.:

Bill of Lading/Air Bill No.:

POSSIBLE SAMPLE HAZARDS/REMARKS

Rad tie to B17RW3

Special Handling and/or Storage

Preservation	Cool 4C	None										
Type of Container	G	G/P										
No. of Container(s)	1	1										
Volume	250mL	250mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions. (DRP 12/2/03)	See item (2) in Special Instructions.										

Sample No.	Matrix *	Sample Date	Sample Time											
B17RW1	SOIL	12-9-3	11:25		X									

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Hughes / TMJ 12-9-03	12-9-03 13:00	Site Fridge Rm A 263	12-9-03 13:00
Site Fridge Rm A 263 TMJ 12-9-03		Received By/Stored In	
Kevin Hughes	12-9-03 1230	Tma Hansen / Tma Hansen	12-9-03 1230
Tma Hansen / Tma Hansen	12-9-03 1430	KLF #2 MO-026	12-9-03 1430
Ref #2 MO-026	12-11-03 1000	Tma Hansen / Tma Hansen	12-11-03 1000
Tma Hansen / Tma Hansen	12-11-03 1010	Ref #2 MO-026	12-11-03 1010

SPECIAL INSTRUCTIONS DRP 12/2/03

The laboratory is to analyze pH within 24 hours of sample receipt. ~~The laboratory is to report kerosene-range organics from the WTPH-D analysis.~~ See SAF COC Comments for holding time issues.

~~(1) Chromium Hex - 7196; NO2/NO3 - 353.2; Sulfides - 9030; Oil & Grease - 413.1~~ DRP 12/2/03

(2) Nickel-63; Gamma Spec - Radium {Radium-226, Radium-228}; Technetium-99; Isotopic Thorium {Thorium-232}; Tritium - H3; Carbon-14; Strontium-89,90 -- Total Sr

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-025-002	Page 1 of 1
Collector: Pope / Hubitter / Pfister	Company Contact: TRENT, STEVE	Telephone No.: 373-5689	Project Coordinator: TRENT, SJ	Price Code 8N; Data Turnaround 45 Days
Project Designation: 200-LW-1/LW-2 Characterization - Soil	Sampling Location: 216-B-58 (~~12.5 - 15 ft~~) (11 - 13.5 ft) H2470		SAF No.: F03-025	Air Quality ☐
Ice Chest No.: ERC 00 006	Field Logbook No.	COA: 119143ES10 (7670)	Method of Shipment: FEDERAL EXPRESS	
Shipped To: ~~EBERLINE SERVICES (Formerly TMA)~~ ~~RECRA~~ Eberline 12/8/03	Offsite Property No.: RSR 106975		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

RADIOACTIVE

Special Handling and/or Storage

Preservation	Cool 4C	None									
Type of Container	G	G/P									
No. of Container(s)	1	1									
Volume	250mL	250mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions. (lined out, 10/28/03)	See item (2) in Special Instructions.									

Sample No.	Matrix *	Sample Date	Sample Time										
B17RT0	SOIL	12-6-3	10:30		✓								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin D. Wheeler	12-6-3 1800	MO026 Fridge #2	12-6-3/1800
MO-026 Fridge #2	12/8/03 1230	Greg Thomas	12/8/03 1230
Greg Thomas	12/8/03 1245	[illegible] ERC	12/08/03 1245
S. Gale	12/17/03 0930	FED EX	
[illegible signature]		[illegible signature]	12/19/03 10:30

SPECIAL INSTRUCTIONS (10/28/03)

~~The laboratory is to analyze pH within 24 hours of sample receipt.~~ The laboratory is to report kerosene range organics from the WTPH-D analysis. See SAF COC Comments for holding time issues.

~~(1) Chromium Hex - 7196; NO2/NO3 - 353.2; Sulfides - 9030; Oil & Grease - 413.1~~ 10/28/03

(2) Nickel-63; Gamma Spec - Radium {Radium-226, Radium-228}; Technetium-99; Isotopic Thorium {Thorium-232}; Tritium - H3; Carbon-14; Strontium-89,90 -- Total Sr

Personnel not available to Relinquish samples from 3728 Ref # 1A on 12/17/03

Matrix *: S=Soil, SE=Sediment, SO=Solid, SI=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

EBERLINE SERVICES

RICHMOND, CA LABORATORY
SAMPLE RECEIPT CHECKLIST

Client: Hanford Date/Time received 12/18/07 10:30 A

CoC No. #03-025-007, 006

Container I.D. No. _____ Requested TAT (Days) 45 P.O. Received Yes [ ] No [ ]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [X]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [X]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [X]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [X]	No [ ]	N/A [ ]
5.	Packing material is:	Wet [ ]	Dry [X]	
6.	Number of samples in shipping container: 2			
7.	Number of containers per sample: 1 (Or see CoC _____)			
8.	Samples are in correct container	Yes [X]	No [ ]	
9.	Paperwork agrees with samples?	Yes [X]	No [ ]	
10.	Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [X]			
11.	Samples are: In good condition [X] Leaking [ ] Broken Container [ ] Missing [ ]			
12.	Samples are: Preserved [ ] Not preserved [ ] pH _____ Preservative _____			
13.	Describe any anomalies: _____			
14.	Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____			
15.	Received by _____ Date: 12/18/07 Time: 10:30 AM			

Customer Sample No.	cpm	mR/hr	wipe	Customer Sample No.	cpm	mR/hr	wipe

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. _____ Calibration date _____

EBERLINE SERVICES

RICHMOND, CA LABORATORY
SAMPLE RECEIPT CHECKLIST

Client: Hanford Date/Time received 12/19/03 10:30

CoC No. F03-025-002

Container I.D. No. _____ Requested TAT (Days) 45 P.O. Received Yes [ ] No [ ]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [X]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [X]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [X]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [X]	No [ ]	N/A [ ]
5.	Packing material is:	Wet [ ]	Dry [X]	
6.	Number of samples in shipping container: 1			
7.	Number of containers per sample: 1 (Or see CoC _____)			
8.	Samples are in correct container	Yes [X]	No [ ]	
9.	Paperwork agrees with samples?	Yes [X]	No [ ]	

10. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [X]
11. Samples are: In good condition [X] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are: Preserved [ ] Not preserved [ ] pH _____ Preservative _____
13. Describe any anomalies: _____
14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
15. Received by _____ Date: 12/19/03 Time: 10:30 AM

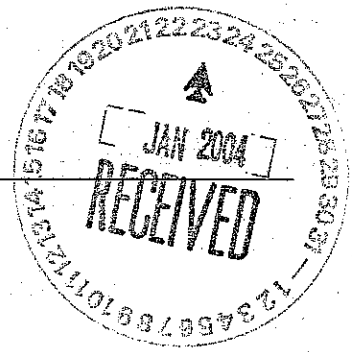
Customer Sample No.	cpm	mR/hr	wipe	Customer Sample No.	cpm	mR/hr	wipe

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. _____ Calibration date _____

LIONVILLE LABORATORY INC.



21 January 2004

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Ave.
Richland, WA 99352

Subject: Contract No. 630
Analytical Data Package

Dear Mr. Trent:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0312L402
SDG #	H2461/H2470
SAF #	F03-025
Date Received	12-18-03
# Samples	4
Matrix	Soil
Volatiles	X
Semivolatiles	
Pest/PCB	
DRO/GRO/KRO	X
Herbicides	
GC Alcohol	
Metals	
Inorganics	X

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

r:\group\pm\orlette\tnu-hanford\data\fc_ltrs.doc

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-025 H2470

DATE RECEIVED: 12/18/03 LVL LOT # :0312L402

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B17RT3						
% SOLIDS	001	S	03L%S195	12/06/03	12/18/03	12/19/03
B17RV8						
% SOLIDS	002	S	03L%S196	12/08/03	12/19/03	12/22/03
% SOLIDS	002 REP	S	03L%S196	12/08/03	12/19/03	12/22/03
CHROMIUM VI	002	S	03LVI089	12/08/03	12/31/03	12/31/03
NITRATE NITRITE	002	S	03LN3074	12/08/03	12/29/03	12/31/03
OIL & GREASE BY GRAV	002	S	03LOG059	12/08/03	12/31/03	01/02/04
SULFIDE	002	S	03LSD061	12/08/03	12/22/03	12/23/03
B17RW1						
% SOLIDS	003	S	03L%S195	12/09/03	12/18/03	12/19/03
CHROMIUM VI	003	S	03LVI089	12/09/03	12/31/03	12/31/03
CHROMIUM VI	003 REP	S	03LVI089	12/09/03	12/31/03	12/31/03
CHROMIUM VI	003 MS	S	03LVI089	12/09/03	12/31/03	12/31/03
CHROMIUM VI	003 MSD	S	03LVI089	12/09/03	12/31/03	12/31/03
NITRATE NITRITE	003	S	03LN3074	12/09/03	12/29/03	12/31/03
NITRATE NITRITE	003 REP	S	03LN3074	12/09/03	12/29/03	12/31/03
NITRATE NITRITE	003 MS	S	03LN3074	12/09/03	12/29/03	12/31/03
OIL & GREASE BY GRAV	003	S	03LOG059	12/09/03	12/31/03	01/02/04
SULFIDE	003	S	03LSD061	12/09/03	12/22/03	12/23/03
B17RT0						
% SOLIDS	004	S	03L%S195	12/06/03	12/18/03	12/19/03
CHROMIUM VI	004	S	03LVI089	12/06/03	12/31/03	12/31/03
NITRATE NITRITE	004	S	03LN3074	12/06/03	12/29/03	12/31/03
OIL & GREASE BY GRAV	004	S	03LOG059	12/06/03	12/31/03	01/02/04
OIL AND GREASE BY GR	004 REP	S	03LOG059	12/06/03	12/31/03	01/02/04
OIL AND GREASE BY GR	004 MS	S	03LOG059	12/06/03	12/31/03	01/02/04
SULFIDE	004	S	03LSD061	12/06/03	12/22/03	12/23/03
SULFIDE	004 REP	S	03LSD061	12/06/03	12/22/03	12/23/03
SULFIDE	004 MS	S	03LSD061	12/06/03	12/22/03	12/23/03

LAB QC:

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-025 H2470

DATE RECEIVED: 12/18/03 LVL LOT # :0312L402

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	MB1	S	03LVI089	N/A	12/31/03	12/31/03
CHROMIUM VI	MB1 BS	S	03LVI089	N/A	12/31/03	12/31/03
CHROMIUM VI	MB1 BSD	S	03LVI089	N/A	12/31/03	12/31/03
NITRATE NITRITE	MB1	S	03LN3074	N/A	12/31/03	12/31/03
NITRATE NITRITE	MB1 BS	S	03LN3074	N/A	12/31/03	12/31/03
OIL & GREASE BY GRAV	MB1	S	03LOG059	N/A	12/31/03	01/02/04
OIL AND GREASE BY GR	MB1 BS	S	03LOG059	N/A	12/31/03	01/02/04
OIL AND GREASE BY GR	MB1 BSD	S	03LOG059	N/A	12/31/03	01/02/04
SULFIDE	MB1	S	03LSD061	N/A	12/22/03	12/23/03
SULFIDE	MB1 BS	S	03LSD061	N/A	12/22/03	12/23/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-025 H2470
LVL#: 0312L402

W.O.#: 11343-606-001-9999-00
Date Received: 12-18-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

3. Sample holding times as required by the method and/or contract were met with the exception of Sulfide that were received past hold.

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy with the exception of Sulfide as noted on the Sample Receipt Checklist.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Oil and Grease was within the 20% Relative Percent Difference (RPD) control limit.

7. The matrix spike recoveries for Chromium VI, Nitrate Nitrite, Oil and Grease and Sulfide were within the 75-125% control limits.

8. The replicate analyses for Percent Solids, Chromium VI, Nitrate Nitrite, Oil and Grease and Sulfide were within the 20% RPD control limit.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

01-14-04
Date

njp\i12-402

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		✓ 9071A	✓ 413.1 (mod.)
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		__ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		✓ 9030B(mod)	
Specific Gravity	__ D1429-76C/ __ D5057-90		
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	

Other: Nitrate Nitrite **Method:** EPA 353.2 (mod.)

Other: **Method**

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/06/04

CLIENT: TNU-HANFORD F03-025 H2470 LVL LOT #: 0312L402

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B17RT3	% Solids	97.5		%	0.01	1.0
-002	B17RV8	% Solids	95.8		%	0.01	1.0
		Chromium VI	0.21	u	MG/KG	0.21	1.0
		Nitrate Nitrite	1.3		MG/KG	0.20	1.0
		Oil & Grease Gravimetri	696	u	MG/KG	696	1.0
		Sulfide	20.4	u	MG/KG	20.4	1.0
-003	B17RW1	% Solids	95.5		%	0.01	1.0
		Chromium VI	0.21	u	MG/KG	0.21	1.0
		Nitrate Nitrite	3.2		MG/KG	0.20	1.0
		Oil & Grease Gravimetri	698	u	MG/KG	698	1.0
		Sulfide	21.3	u	MG/KG	21.3	1.0
-004	B17RT0	% Solids	94.0		%	0.01	1.0
		Chromium VI	0.21	u	MG/KG	0.21	1.0
		Nitrate Nitrite	1.1		MG/KG	0.21	1.0
		Oil & Grease Gravimetri	709	u	MG/KG	709	1.0
		Sulfide	21.9	u	MG/KG	21.9	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/06/04

CLIENT: TNU-HANFORD F03-025 H2470 LVL LOT #: 0312L402

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LVI089-MB1	Chromium VI	0.20	u	MG/KG	0.20	1.0
BLANK10	03LN3074-MB1	Nitrate Nitrite	0.20	u	MG/KG	0.20	1.0
BLANK10	03LOG059-MB1	Oil & Grease Gravimetri	667	u	MG/KG	667	1.0
BLANK10	03LSD061-MB1	Sulfide	40.0	u	MG/KG	40.0	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/06/04

CLIENT: TNU-HANFORD F03-025 H2470 LVL LOT #: 0312L402

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-003	B17RW1	Soluble Chromium VI	4.2	0.21u	4.2	95.3	1.0
		Insoluble Chromium VI	1070	0.21u	1020	105.0	100
		Nitrate Nitrite	16.6	3.2	12.7	105.8	2.0
-004	B17RT0	Oil & Grease Gravimetr	5570	709 u	5910	94.2	1.0
		Sulfide	161	12.6	194	76.6	1.0
BLANK10	03LVI089-MB1	Soluble Chromium VI	3.8	0.20u	4.0	95.3	1.0
		Insoluble Chromium VI	1170	0.20u	1180	99.1	100
BLANK10	03LN3074-MB1	Nitrate Nitrite	5.2	0.20u	5.0	103.2	1.0
BLANK10	03LOG059-MB1	Oil & Grease Gravimetr	5400	667 u	5560	97.1	1.0
		Oil & Grease - Grav M	5300	667 u	5560	95.0	1.0
BLANK10	03LSD061-MB1	Sulfide	339	40.0 u	379	89.4	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 01/06/04

CLIENT: TNU-HANFORD F03-025 H2470 LVL LOT #: 0312L402

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
BLANK10	03LOG059-MB1	Oil & Grease - Grav	97.1	95.0	2.2

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 01/06/04

CLIENT: TNU-HANFORD F03-025 H2470 LVL LOT #: 0312L402

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	B17RV8	% Solids	95.8	95.8	0.00	1.0
-003REP	B17RW1	Chromium VI	0.21u	0.21u	NC	1.0
		Nitrate Nitrite	3.2	3.4	6.5	1.0
-004REP	B17RT0	Oil & Grease Gravimetri	709 u	709 u	NC	1.0
		Sulfide	21.9 u	21.7 u	NC	1.0

Lionville Laboratory Use Only

0312L402

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client TNX- HANFORD SAF# F03-025

Est. Final Proj. Sampling Date

Project # 113497606-001-9999.00

Project Contact/Phone #

Lionville Laboratory Project Manager OJ

QC SPEC Del SAS TAT 30 days

Date Rec'd 12-18-03 Date Due 1-17-04

		AB					C				D					
Refrigerator #		1					6				6					
#/Type Container	Liquid															
	Solid	2AG					6G				1AG					
Volume	Liquid															
	Solid	40					40				250					
Preservatives		—					—				—					
ANALYSES REQUESTED →		ORGANIC					TPH				INORG					
		VOA	BNA	Pest/PCB	Herb						Metal	CN				
		Lionville Laboratory Use Only														
		H2SO4					ODRO OGRO						ICP6	IN3N2 ISFD	ZOGGR	

MATRIX CODES:	Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected															
S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish	001	B17RT3			S	12-6-03	1545	2					1									
	002	1 V8				12-8-03	0840										1	✓	✓			
	003	1 WI			L	12-9-03	1125										1	✓	✓			
	004	B17RT6			S	12/6/03	1030										1	✓	✓			

Special Instructions: SAF # F03-025

Run Matrix QC

DATE/REVISIONS:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Lionville Laboratory Use Only

Samples were:
1) Shipped ____ or Hand Delivered ____
Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Samples Properly Preserved Y or N
5) Received Within Holding Times Y or N

Tamper Resistant Seal was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Cooler Temp. _____ °C

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
		12/18/03	1040

Relinquished by	Received by	Date	Time
"COMPOSITE WASTE"	ORIGINAL REWRITTEN		

0312C400

FLUOR Hanford Inc. Johansen	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-025-003	Page 1 of 1
Collector: Pope / Pfister / Hughes	Company Contact: TRENT, STEVE	Telephone No.: 373-5689	Project Coordinator: TRENT, SJ	Price Code 8N; Data Turnaround 45 Days
Project Designation: 200-LW-1/LW-2 Characterization - Soil	Sampling Location: 216-B-58 (17.5 - 20 ft)		SAF No.: F03-025	Air Quality ☐
Ice Chest No.: ERC 02 505	Field Logbook No.: HNF-N-330-1	COA: 119143ES10	Method of Shipment: FEDERAL EXPRESS	
Shipped To: EBERLINE SERVICES (Formerly TMA)	Offsite Property No.: A040 064		Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Rad Auto B17RT5

Special Handling and/or Storage

Preservation	Cool 4C	Cool 4C		
Type of Container	aGs* MJ 12-12-03	aG		
No. of Container(s)	2	1 MJ 12-11-03		
Volume	40mL	~~120mL~~ 40mL		
SAMPLE ANALYSIS	VOA - 8260A (TCL)	See item (1) in Special Instructions.		

Sample No.	Matrix *	Sample Date	Sample Time		
B17RT3	SOIL	12-6-03	1545	X	X

CHAIN OF POSSESSION	Date/Time	Sign/Print Names Received By/Stored In	Date/Time
Relinquished By/Removed From: Johansen / Johansen D-DB	1530	Received By/Stored In: Ref # 2MO-026	12-12-03 1530
Relinquished By/Removed From: MO-026 Ref 2	12/17/03 0930	Received By/Stored In: M.A. Baechler / M.A. Baechler	12/17/03 0930
Relinquished By/Removed From: M.A. Baechler / M.A. Baechler	12/17/03 0930	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: Fed Ex	12-18-03 1040	Received By/Stored In: [illegible]	12-18-03 1040
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS MJ 12-11-03 / Stet

~~The laboratory is to analyze pH within 24 hours of sample receipt.~~ The laboratory is to report kerosene range organics from the WTPH-D analysis. See SAF COC Comments for holding time issues.

(1) TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - kerosene range}; TPH-Gasoline Range - WTPH-G

Matrix *: S=Soil, SE=Sediment, SO=Solid, SI=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solids, DL=Drum Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

Fluor Hanford, Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		Page 1 of 2
Collector Pope/Pfister/Hughes	Company Contact Trent, Steve · Telephone No. 373-5689	Project Coordinator Trent, SJ	Price Code · Data Turnaround
Project Designation 200-LW-1/LW-2 Charac.	Sampling Location 216-B-58 (35-37.5 ft)	SAF No. F03-025	Air Quality ☐
Ice Chest No. ERC 02 505	Field Logbook No. HNF-N-356 1 · COA 119143ES10	Method of Shipment Federal Express	
Shipped To ~~Eberline~~ Recra	Offsite Property No. A040 064	Bill of Lading/Air Bill No. SEE OSP C	

POSSIBLE SAMPLE HAZARDS/REMARKS

Rad Tie TO B17RW0

Special Handling and/or Storage

Preservation	Cool 4C	NONE										
Type of Container	G	G/P										
No. of Container(s)	250mL	250mL										
Volume	1											
SAMPLE ANALYSIS	See item (1) special instructions	See item (2) special instructions										

(Column 2 crossed out, initialed MAB 12/17/03)

Sample No.	Matrix*	Sample Date	Sample Time											
2 B17RV8	Soil	12-8-03	0840	X										

CHAIN OF POSSESSION	Date/Time	Sign/Print Names Received By/Stored In	Date/Time
Relinquished By/Removed From [signature]	12/17/03 0930	M.A. Buckner [signature]	12/17/03 0930
Relinquished By/Removed From M.A. Buckner [signature]	12/17/03 0930	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From Fed Ex	12-18-03 1040	Received By/Stored In [signature]	12-18-03 1040
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Chromium Hex - 7196; NO2/NO3 - 353.2; Sulfides - 9030, Oil + Grease - 413.1

(2) ~~Nickel-63; Gamma Spec - Radium; Radium 228; Tech-99; Isotopic Thorium; Thorium-232;~~ Tritium-H3; Carbon-14; ~~Sr-89,90 - Total Sr~~ TMJ 12/16/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618 (03/03)

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-025-006	Page 1 of 2
Collector Pope/Foster/Hughes	Company Contact TRENT, STEVE	Telephone No. 373-5689	Project Coordinator TRENT, SJ	Price Code 8N / Data Turnaround 45 Days
Project Designation 200-LW-1/LW-2 Characterization - Soil	Sampling Location 216-B-58 (35 - 37.5 ft)		SAF No. F03-025	Air Quality ☐
Ice Chest No. GAP-03-011	Field Logbook No. HNF-3561	COA 119143ES10	Method of Shipment FEDERAL EXPRESS	
Shipped To ~~EBERLINE SERVICES (Formerly TMA)~~ MS 10-29-03 Reera	Offsite Property No.		Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS

Rad to to B17RW0

Special Handling and/or Storage

Preservation	Cool 4C	None									
Type of Container	G	G/P									
No. of Container(s)	1	1									
Volume	250mL	250mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions. RP 12-2-03									
Sample No.	Matrix *	Sample Date	Sample Time								
B17RV8	SOIL	12-8-03	0840	✓							

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From Kevin Dahlgren	Date/Time 1800 12-8-3	Received By/Stored In Site fridge RMA 26B	Date/Time 1800 12-8-3
Relinquished By/Removed From Site fridge RMA 26B 12-9-3	Date/Time 0830	Received By/Stored In Kevin Dahlgren	Date/Time 0830 12-9-3
Relinquished By/Removed From Kellin Hughes	Date/Time 0930 12-9-03	Received By/Stored In TM Hanson/TM Hanson	Date/Time 1230 12-9-03
Relinquished By/Removed From TM Hanson/TM Hanson 12-9-03 1430	Date/Time	Received By/Stored In Ref #2 12-9-03 1430	Date/Time
Relinquished By/Removed From Ref #2 12-11-03	Date/Time MO-026 1000	Received By/Stored In TM Hanson/TM Hanson 12-11-03	Date/Time 1000
Relinquished By/Removed From TM Hanson/TM Hanson 12-11-03	Date/Time 1010	Received By/Stored In Ref #2 MO-026	Date/Time 12-11-03 1010

SPECIAL INSTRUCTIONS

The laboratory is to analyze pH within 24 hours of sample receipt. The laboratory is to report kerosene range organics from the WTPH-D analysis. See SAF COC Comments for holding time issues.

(1) Chromium Hex - 7196; NO2/NO3 - 353.2; Sulfides - 9030; Oil & Grease - 413.1

~~(2) Nickel-63, Gamma Spec - Radium (Radium-226, Radium-228); Technetium-99; Isotopic Thorium (Thorium-232); Tritium - H3; Carbon-14; Strontium-89,90 - Total Sr~~ RP 12/2/3

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-025-007	Page 1 of 1

Collector: Pope/Fisher/Hughes	Company Contact: TRENT, STEVE — Telephone No. 373-5689	Project Coordinator: TRENT, SJ	Price Code 8N — Data Turnaround 45 Days
Project Designation: 200-LW-1/LW-2 Characterization - Soil	Sampling Location: 216-B-58 (52.5 - 55 ft)	SAF No. F03-025	Air Quality ☐
Ice Chest No. ERC02 505	Field Logbook No. HNF3561 — COA 119143ES10	Method of Shipment: FEDERAL EXPRESS	
Shipped To: ~~EBERLINE SERVICES (Formerly TMA)~~ TMJ 10-29-03 Perva	Offsite Property No. A040 064	Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Rad tie to B17RW3

Special Handling and/or Storage

Preservation	Cool 4C	~~None~~									
Type of Container	G	~~G/P~~									
No. of Container(s)	1	~~1~~									
Volume	250mL	~~250mL~~									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	~~See item (2) in Special Instructions.~~ 9R 12/2/03									

Sample No.	Matrix *	Sample Date	Sample Time										
3 B17RW1	SOIL	12-9-3	11:25	X									

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Hughes	12-9-03 1230	TM Mansen/TM Mansen	12-9-03 1230
TM Mansen/TM Mansen	12-9-03 1430	REF #2 MO-026	12-9-03 1430
REF #2 MO-026	12-11-03 1000	TM Mansen/TM Mansen	12-11-03 1000
TM Mansen/TM Mansen	12-11-03 1010	REF #2 MO-026	12-11-03 1010
[illegible]	12/17/03 0930	M.A. Buechly / M.L. Buechler	12/17/03 0930
M.A. Buechler / M.L. Buechler	12/17/03 0930	Fed Ex	

SPECIAL INSTRUCTIONS

The laboratory is to analyze pH within 24 hours of sample receipt. The laboratory is to report kerosene range organics from the WTPH-D analysis. See SAF COC Comments for holding time issues.

(1) Chromium Hex - 7196; NO2/NO3 - 353.2; Sulfides - 9030; Oil & Grease - 413.1

~~(2) Nickel-63, Gamma Spec - Radium (Radium-226, Radium-228), Technetium-99, Isotopic Thorium (Thorium-232), Tritium - H3, Carbon-14, Strontium-89,90 — Total Sr~~ 9R 12/2/03

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

Fed Ex 12-18-03 1040 [signature] 12-18/03 1040

FLUOR Hanford Inc.	CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-025-002	Page 1 of 1

Collector: POPE / HUGHES / Pfister	Company Contact: TRENT, STEVE	Telephone No.: 373-5689	Project Coordinator: TRENT, SJ	Price Code 8N; Data Turnaround 45 Days
Project Designation: 200-LW-1/LW-2 Characterization - Soil	Sampling Location: 216-B-58 (~~12.5 - 13 ft~~) 12.6-3 11 - 13.5 ft		SAF No.: F03-025	Air Quality ☐
Ice Chest No.: ERC 01037	Field Logbook No.	COA: 119143ES10	Method of Shipment: FEDERAL EXPRESS	
Shipped To: ~~EBERLINE SERVICES (Formerly TMA)~~ RCRA 10/28/03	Offsite Property No.: RSR 185826		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

RADIOACTIVE

Special Handling and/or Storage

Preservation	Cool 4C	None									
Type of Container	G	G/P									
No. of Container(s)	1	1									
Volume	250mL	250mL									
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions. 10/28/03									

Sample No.	Matrix *	Sample Date	Sample Time											
B17RT0	SOIL	12-6-3	10:30	—										

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Kevin Hughes	12-6-3 1800	M0026 Fridge #2	12-6-3 / 1800
M0-026 Fridge #2	12/8/03 1230	Greg Thomas	12/8/03 1230
Greg Thomas	12/8/03 1245	David St. John ERC	12/08/03 1245
SJ GALE A	12-17-03 0930	FED EX	
FedEx	12-18-03 1040	[illegible]	12-18-03 1040

SPECIAL INSTRUCTIONS

The laboratory is to analyze pH within 24 hours of sample receipt. The laboratory is to report kerosene range organics from the WTPH-D analysis. See SAF COC Comments for holding time issues.

(1) Chromium Hex - 7196; NO2/NO3 - 353.2; Sulfides - 9030; Oil & Grease - 413.1

~~(2) Nickel-63; Gamma Spec - Radium (Radium-226, Radium-228); Technetium-99; Isotopic Thorium (Thorium-232); Tritium - H3; Carbon-14; Strontium-89,90 -- Total Sr~~

10/28/03

Personnel not available to Relinquish samples from 3728 Ref # 1A on 12/17/03

Matrix *

S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

A-6003-618(03/03)

Lionville Laboratory Incorporated
SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: TNU - HANFORD **Date:** 12-18-03

Purchase Order / Project# / SAF# / SOW# / Release #: F03-025

LvLI Batch # : 0312C 402 **Sample Custodian:** [signature]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped	Carrier FedEx		Airbill# 7909 9575 7916 8409 6234 5150	
2. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ No Seals	Comments
3. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No		
4. All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible?	☑ Yes	☐ No		
5. Samples received cooled or ambient?	Temp 5.5°C		Cooler # ERC-02-505 + 01-037	
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals	
7. coc signed and dated?	☑ Yes	☐ No		
8. Sample containers are intact?	☑ Yes	☐ No		
9. All samples on coc received? All samples received on coc?	☑ Yes	☐ No		
10. All sample label information matches coc?	☑ Yes	☐ No		
11. Samples properly preserved?	☑ Yes	☐ No		
12. Samples received within hold times? Short holds taken to wet lab?	☑ Yes 12-19-03	☑ No	Sulfide rec'd past hold	
13. VOA, TOC, TOX free of headspace?	☑ Yes	☐ No	☐ N/A	
14. QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☑ N/A	
15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)	☑ Yes 12-19-03	☑ No	See #12	
16. Project Manager contacted concerning discrepancies? name/date (or samples outside criteria)	☐ Yes	☐ No	☑ No Discrepancies	

SR-002-B